

## ABSTRACT

A diagnostic method and associated system includes the steps of exposing at least one sample location with excitation radiation through a single optical waveguide or a single optical waveguide bundle, wherein the sample emits emission radiation in response to the excitation radiation. The same single optical waveguide or the single optical waveguide bundle receives at least a portion of the emission radiation from the sample, thus providing co-registration of the excitation radiation and the emission radiation. The wavelength of the excitation radiation and emission radiation is synchronously scanned to produce a spectrum upon which an image can be formed. An increased emission signal is generated by the enhanced overlap of the excitation and emission focal volumes provided by co-registration of the excitation and emission signals thus increasing the sensitivity as well as decreasing the exposure time necessary to obtain an image.